

REMARKS

It is believed that no new matter has been introduced into this application by reason of the amendments to the claims presented hereinabove. The amendments to the claims, other than those directed to the rejection based on 35 USC 101, are intended to clarify some of the novel features of the Applicant's claimed invention.

35 USC 101: Claims 23-33

The Examiner rejected Claims 23-33 under 35 USC 101 as being directed to non-statutory subject matter. More specifically, the Examiner explained that a computer program is not eligible subject matter for a patent unless the computer program is claimed as embedded on a computer readable medium.

Claims 23-33 have been amended to overcome this objection. Accordingly, it is believed that subject matter of Claims 23-33 is within the scope of Section 101.

35 USC 102(e): Claims 1-33

The Examiner rejected Claims 1-33 under 35 USC 102(e) as being unpatentable over US Patent Application Publication US2006/0084859 (Johnson et al.).

Before discussing this ground of rejection, a brief review of the nature of the Applicant's claimed invention will be presented. The following explanation is not intended to be limiting, but rather is intended to clarify the nature and operation of a preferred embodiment of the invention.

The present invention relates to a method and system for generating a three-dimensional radar image of the interior of a body part. The radar image is constructed based on radiation information received from an array of scan locations relative to the body part, exterior three-dimensional geometric surface profile information relating to the body part, and estimates of body part properties. The image comprises multiple image points representing the interior of the body part. **Each image point** is constructed utilizing a unique **synthetic focusing** technique.

The unique **synthetic focusing** technique that is employed in the Applicant's claimed system and method to construct **each image point** comprises the steps of:

- 1) determining the **minimum optical paths** between each scan location and image point based on the scan locations, exterior three-dimensional geometric profile information and body part properties,
- 2) **phase-shifting** the radiation information based on the minimum optical paths to **equalize** the radiation information, and
- 3) **summing** the equalised radiation information over all scan locations and all frequencies to provide a value for the image point.

The Applicant's claimed synthetic focusing technique is repeated for all image points in the three-dimensional radar image.

The Applicant respectfully disagrees with the Examiner's conclusion that the claimed invention lacks novelty. The Applicant submits that independent Claims 1, 12, and 23 as amended are novel relative to Johnson et al. In brief, the Applicant's claimed method as set forth in Claim 1, the Applicant's claimed system as set forth in Claim 12, and the Applicant's claimed computer program as set forth in Claim 23 are directed to the generation of a three-dimensional radar image of the interior of a body part using a unique **synthetic focusing** technique. In contrast, Johnson et al. relates to an imaging method that uses an **inverse scattering** technique. As discussed more fully below, synthetic focusing and inverse scattering are different techniques. Therefore, Johnson et al. is not relevant with respect to the novelty of the Applicant's claimed method, system, and computer program.

Furthermore, the Examiner has not clearly specified the features described in Johnson et al. that correspond to each and every feature of the Applicant's claimed method, system, or computer program, as the case may be. The Examiner has merely referenced various paragraphs of the Johnson et al. patent without explaining the text in those paragraphs that he considers to describe the features recited in the Applicant's claims.

Johnson et al. describes an electromagnetic imaging system that employs an **inverse scattering** technique. Inverse scattering is an entirely different approach to imaging compared with synthetic focusing. **Inverse scattering** attempts to reconstruct the **complex permittivity** in the object as a function of position from measurements of the scattered field external to the object. Images constitute an inverse scattering problem which is ill-posed in the mathematical sense because of the non-uniqueness of the solution. The solution of inverse scattering problems of this nature is highly complex and computationally intensive.

In contrast, the Applicant's **synthetic focusing** technique involves forming **an image** based on the intensity of the scattered field as a function of position from measurements of scattered fields external to the object. The images are generated using a novel focusing algorithm to provide a measure of the scattered field intensity at a point in the object under test.

In addition, the Applicant notes that paragraph 20 in Johnson et al. indicates that the 3D volume of data from the inverse scattering is created by combining multiple 2D image slices of the object. In contrast, the Applicant's claim system and method as set forth in the claims is directed to creating each individual image point within the 3D volume of the image by synthetically focusing the radiation information. The Applicant's claimed method and system do not require the construction and combining of multiple 2D image slices to form a 3D image.

Johnson et al. does not relate to synthetic focusing which is a novel feature of the Applicant's claimed method, system, and computer program. Instead, Johnson et al. describes an inverse scattering technique. In the absence of an explanation of how the inverse scattering technique described in Johnson et al. is the same as the Applicant's claimed synthetic focusing method and system, Johnson et al. fails to present a *prima facie* case of unpatentability relative to the Applicant's claimed method, system, and computer program. Therefore, the Applicant's claimed method, system, and computer program as set forth in independent claims 1, 12, and 23, respectfully, is novel relative to Johnson et al.

At paragraph 4, on page 3 of the Official Action, the Examiner asserts that paragraphs 5, 345, 361, 371, 407, and 524-527 of Johnson et al. describe the following features.

... an input for receiving input data comprising: radiation information obtained at an array of scan locations relative to the body part, the radiation information being obtained at multiple microwave frequencies at each of the scan locations; surface profile information relating to the body part; and estimates of body part properties.

It is not clear from the cited paragraphs of Johnson et al. how those features are taught by the reference. For example, nowhere in paragraphs 5, 345, 361, 371, 407, and 524-527 is it described how to obtain surface profile information relating to the body part. Nor do any of the cited paragraphs describe how to obtain “exterior three-dimensional geometric surface profile information” as set forth for the Applicant’s claimed method, system, and computer program in the respective, amended independent claims. It appears that the Examiner has merely restated the text of Applicant’s Claim 12 without pointing out how the cited reference actually teaches or describes the claimed features.

In paragraph 4 on page 3 of the Official Action, the Examiner further states that paragraphs 5, 7, 144, 182, 343-344, and 416-419 of Johnson et al. disclose the following features.

... a processor arranged to process input data to construct each image point by: determining the minimum multiple optical paths between each scan location and the image point being based on the scan locations, surface profile information and body part properties; phase-shifting the radiation information based on the minimum optical paths to equalise the radiation information; and then summing the equalised radiation information over all scan locations and all frequencies to provide a value for the image point.

It is not readily apparent how the cited paragraphs from Johnson et al. describe the Applicant’s claimed features. Indeed, it appears that the Examiner has again merely parroted selected text from Applicant’s Claim 12 and then asserted that the feature is described in Johnson et al. For

example, none of the paragraphs from Johnson et al. describe the step of “determining the minimum optical paths between each scan location and the image point based on the scan locations, exterior three-dimensional geometric surface profile information and body part properties” as set forth in the amended independent claims.

The failure of the Examiner to clearly explain what features described in the reference correspond to claimed features of the Applicant’s claimed method, system, or computer program is unreasonable and unfair. Such a rejection prevents the Applicant from understanding how the Examiner is interpreting the reference and the claims. A proper response cannot be formulated if the basis for the rejection is not clearly explained. The Applicant should not have to speculate about the factual basis for a rejection based on alleged prior art. In view of the vagueness of the Examiner’s explanation of the basis for the rejection under Section 102(e), it appears that the rejection fails to raise a *prima facie* case of unpatentability. If the Examiner chooses to maintain this ground in the next action on this application, then the Applicant respectfully requests that the Examiner clearly identify the features and/or steps described in Johnson et al. that the Examiner believes correspond to the respective features and/or steps of the Applicant’s claimed system and method as set forth in independent Claims 1, 12, and 23.

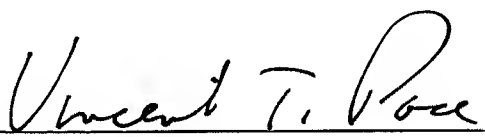
Claims 2-11 depend from Claim 1 either directly or indirectly, and thus, include all of the steps and features of Claim 1. Therefore, Claims 2-11 are novel relative to Johnson et al. for at least the same reasons as Claim 1. Claims 13-22 depend from Claim 12 either directly or indirectly, and thus, include all of the features of Claim 12. Therefore, Claims 13-22 are novel relative to Johnson et al. for at least the same reasons as Claim 12. Claims 24-33 depend from Claim 23 either directly or indirectly, and thus, include all of the features of Claim 23. Therefore, Claims 24-33 are novel relative to Johnson et al. for at least the same reasons as Claim 23.

CONCLUSION

In view of the foregoing amendments and remarks, it is believed that the claims pending in this application are in condition for allowance. The Applicant respectfully requests that the Examiner reconsider and withdraw the rejections of the claims.

Respectfully submitted,

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